

REMARKS

Claims 1 and 3-18 are all of the claims pending in the application. Applicants address the above-noted amendments below in reference to the Examiner's comments.

On pages 2-3 of the Office Action, the Examiner makes various objection/rejections under 35 U.S.C. §112 regarding Claim 2. In particular, the Examiner is unsure how Claim 2 with its extracting step, relates to the Claim 1 process, and thus also finds this claim "indefinite and non-enabled".

Applicants have canceled Claim 2, without prejudice, and have added new Claims 17 and 18. This recitation is supported, for example, on page 6 of the specification which discloses a two step hydrolysis procedure. The first step does not completely hydrolyze the starting material, and a second step leads to complete hydrolysis.

Applicants submit that the cancellation of Claim 2 and the addition of new Claims 17 and 18 render the Examiner's objections/rejections of Claim 2 moot.

On page 3 of the Office Action, the Examiner states that Claim 1 is indefinite because it does not have clear antecedent basis for "the free hexoses" in line 6.

In order to obviate this basis of rejection, Applicants have amended Claim 1 to delete "the" before "free hexoses" and thus remove any lack of antecedent basis problem.

On pages 3-4 of the Office Action, the Examiner notes that Claim 11 recites that the hydrolysis is provided by both steam explosion and enzymatic hydrolysis, while Claim 14 only requires that the hydrolysis be enzymatic. The Examiner states that this claim language is indefinite.

Claim 11 is directed to an embodiment where the hydrolysis takes place under two different techniques as disclosed on page 6 of the specification. Claim 14 only recites the preferred technique of enzymatic hydrolysis. Therefore, Applicants submit that there is no need to recite either technique in the alternative in Claim 11, nor cancel Claim 14, as suggested by the Examiner.

On page 4 of the Office Action, the Examiner states that "by" in Claim 12, line 3 should be changed to -- with a -- to be clearer.

In order to obviate this basis of rejection, Applicants have amended the claim as per the Examiner's suggestion.

On pages 4-5 of the Office Action, Claims 1-16 are rejected under 35 U.S.C. §102(b) as being anticipated by Hekkila, et al.

Applicants respectfully traverse.

In the present invention, ethanol is a secondary product produced in economically significant amounts, i.e., ethanol is not an undesired by-product but a useful end-product.

US Patent 5,081,026 does not teach that large amounts of ethanol can be produced in the fermentation conditions used in

the present invention. In contrast, in the present invention, ethanol can be economically produced also when the xylitol production level is low due to a reduced xylose/xylan content in the raw material (e.g., due to a prior xylan extraction), since ethanol is produced by a conversion of free hexoses.

Moreover, the presently claimed invention uses a starting material which contains significant amounts of hexoses, which are fermented to ethanol. In order for the starting material to contain large amounts of hexoses, the starting material must have a different composition and must be processed differently (i.e., more strongly) than as disclosed US Patent 5,081,026. That is, since U.S. Patent No. 5,081,026 is not primarily concerned with the production of ethanol, there would be no need to provide a starting material processed to contain free hexose.

Accordingly, Applicants respectfully submit that the presently claimed invention is not taught by U.S. Patent No. 5,081,026, and request withdrawal of this anticipated rejection.

On pages 5 to 6 of the Office Action, Claims 1-16 are rejected under 35 U.S.C. §103 as being obvious over Jeffries or Lohmeier-Vogel et al in view of Jaffe and Onishi.

Applicants respectfully traverse for the following reasons.

The cited references disclose: -conversion of xylose (a pentose) into ethanol (Jeffries), - azide addition in order to enhance ethanol production from pentoses (Lohmeier-Vogel), - fermentation with yeasts incapable of using pentoses (Jaffe), or

- fermentation using glucose or D-xylulose as the main carbon source in the production of xylitol (Onishi). The present invention claims quite the opposite, namely - production of xylitol from xylose (a pentose) simultaneously with the production of ethanol from hexoses (e.g. glucose).

In the present invention, xylose is not converted into ethanol, as in Jeffries and Lohmeier-Vogel. However, xylose is converted to xylitol in the present invention, and hence the xylose is not inert, as in Jaffe. In Onishi, only xylitol is produced. However, the presently claimed starting material (which is converted to xylitol) of the present invention is xylose, which is not mentioned in Onishi (D-xylulose or glucose are used as starting materials in Onishi).

Accordingly, Applicants submit that the presently claimed process is not taught or suggested by any of the above-cited references; therefore, Applicants respectfully request that the Examiner withdraw the pending obviousness rejection over the above-cited references.

CONCLUSION

In view of the above remarks and amendments to the claims, Applicants' respectfully submit that the presently claimed invention fully meets the requirements of 35 U.S.C. § 112, and is neither anticipated by nor obvious over the cited references.

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Serial No. 07/910,133
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Accordingly, all rejections should be withdrawn and this case should be passed to issuance.

Any inquiry concerning this submission should be directed to the undersigned at the telephone number listed below.

Respectfully submitted,

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